

Introductory course on Mendelian randomization (MR)

Start: 31 January 2022

End: 02 February 2022

Location: Online. Link tba.

Organiser: Pekka Martikainen

Instructors:

- Deborah Lawlor
- Eleanor Sanderson
- Laurence Howe
- Yoonsu Cho
- Neil Davies
- Kaitlin Wade
- Ryan Langdon

Course description

Mendelian randomization (MR) is a study that uses genetic variants as instrumental variables to test the causal effect of a (non-genetic) risk factor on a disease or health-related outcome.

This three-day virtual PHDS elective course will teach participants how to conduct MR analyses using both summary and individual-level data and highlight issues they may face when conducting MR analyses. The course will include practical sessions to familiarise participants with MR software packages. We will also outline some of the more recent developments in the field such as multivariable MR and within-family MR.

Organization

The course is scheduled between 10 and 16 (EET) each day, and consists of online and pre-recorded lectures, practical sessions and Q&As. Some of the practical sessions will use R and all students should install R on their computer before joining the course.

Prerequisites

Students should be familiar with linear regression prior to joining the course. The course will use R for most of the practicals and so a basic knowledge of R would be beneficial, however all code will be provided.

Examination

There is no assessment for this course.

General Readings

- Davey Smith, George, and Shah Ebrahim. "'Mendelian randomization': can genetic epidemiology contribute to understanding environmental determinants of disease?" *International journal of epidemiology* 32.1 (2003): 1-22.
- Lawlor, Debbie A., et al. "Mendelian randomization: using genes as instruments for making causal inferences in epidemiology." *Statistics in medicine* 27.8 (2008): 1133-1163.
- Davey Smith, George, and Gibran Hemani. "Mendelian randomization: genetic anchors for causal inference in epidemiological studies." *Human molecular genetics* 23.R1 (2014): R89-R98.

Admissions

This course is restricted to IMPRS-PHDS students. A maximum of 25 participants will be admitted.

Questions about the course should be directed to phds@demogr.mpg.de.